Stoller
Grand Junction Office established 1959

GJO-2004-553-TAC

C4235
Log Data Report

Borehole Information:

Borehole: C4235			**Site:** West of fire station		
Coordinates (WA State Plane)		**GWL (ft)[1]:** 370.4		**GWL Date:**	12/22/2003
North	**East**	**Drill Date**	**TOC[2] Elevation**	**Total Depth (ft)**	**Type**
n/a[3]	n/a	Dec. 2003	n/a	380	Becker

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded steel	0	6 1/4	6	0.12	0	380
Threaded steel	0	9	8	1/2	0	380
The logging engineer measured the casing stickup using a steel tape. The casing thicknesses for both the 6- and 8-in. casings are from a memorandum written by R. McCain dated July 9, 2003.						

Borehole Notes:

Zero reference is the ground surface. This borehole was logged through the drill pipe. A 1-ft layer of crushed gravel is on the ground surface surrounding the drill site. Groundwater level was measured using an acoustic well probe from top-of-casing. This depth was reported by Tim Hottle, Fluor's drilling supervisor.

The Becker drilling system uses a dual-wall casing. Air flows down the annulus and cuttings are returned inside the inner casing. Total wall thickness is 0.620 in., increasing to 1.115 in. at the casing joints, which occur at 10-ft intervals.

Logging Equipment Information:

Logging System:	Gamma 1G	**Type:**	35% HPGe (34-TP10967A)
Calibration Date:	04/2003	**Calibration Reference:**	GJO-2003-438-TAR
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0

Gross Gamma Logging System (GGLS) Log Run Information:

Log Run	1	2	3/Repeat	4	
Date	12/22/03	12/22/03	12/22/03	12/22/03	12/22/03
Logging Engineer	Spatz	Spatz	Spatz	Spatz	Spatz
Start Depth (ft)	380.0	306.0	194.5	156.0	66.0
Finish Depth (ft)	305.0	156.5	156.5	65.5	1.0
Count Time (sec)	N/A[4]	N/A	N/A	N/A	N/A
Live/Real	R	R	R	R	R
Shield (Y/N)	N	N	N	N	N
Sample Interval	0.5 ft	0.5 ft	0.5 ft	0.5 ft	0.5 ft

Log Run	1	2	3/Repeat	4	
MSA Interval (ft)	N/A	N/A	N/A	N/A	N/A
ft/min	1.0	1.0	1.0	1.0	1.0
Pre-Verification	AG038CAB	AG038CAB	AG038CAB	AG038CAB	AG038CAB
Start File	AG038000	AG038151	AG038451	AG038528	AG038710
Finish File	AG038150	AG038450	AG038527	AG038709	AG038840
Post-Verification	AG038CAA	AG038CAA	AG038CAA	AG038CAA	AG038CAA
Depth Return Error (in.)	N/A	N/A	N/A	N/A	N/A
Comments	No fine-gain adjustment. Cable over-wrap adjustment.	No fine-gain adjustment.	New data directory. No fine-gain adjustment.	No fine-gain adjustment. Cable over-wrap adjustment.	No fine-gain adjustment.

Logging Operation Notes:

The borehole was logged through drill pipe. Logging through the drill pipe used in the construction of this borehole precludes the acquisition of spectral gamma log spectra that have consistently statistically valid photopeaks.

Gross gamma data were collected using Gamma 1G. Pre- and post-survey verification measurements employed the Amersham KUT (^{40}K, ^{238}U, and ^{232}Th) verifier with serial number 118. Logging was performed with a centralizer installed on the sonde. Zero reference was the ground surface. Maximum logging depth achieved was 380 ft.

Analysis Notes:

Analyst:	Henwood	Date:	12/23/03	Reference:	

Pre-run and post-run verification spectra were collected at the beginning and end of the day and compared to the acceptance criteria. All of the verification spectra were within the acceptance criteria.

Log spectra were processed in batch mode using APTEC SUPERVISOR to determine gross counts, and count rates were calculated in EXCEL. Zero reference was the ground surface. Water and dead time corrections were not applied to the data. The influence of the thick joints is apparent on the total gamma where reduced count rates are exhibited at approximately 10-ft depth intervals.

Log Plot Notes:

Log plots are provided for gross gamma counts per second. Plots of the repeat log versus the original log are included.

Results and Interpretations:

Significant changes in the gross gamma count rates occurred in this borehole below 360 ft in depth. Reduced count rate is observed at the groundwater level of approximately 370 ft. A decrease in gamma activity occurs at each casing joint, where the increase in wall thickness results in greater attenuation of gamma activity.

The plots of the repeat logs demonstrate reasonable repeatability of the gross gamma logging system (GGLS).

[1] GWL – groundwater level
[2] TOC – top of casing
[3] n/a – not available
[4] N/A – not applicable

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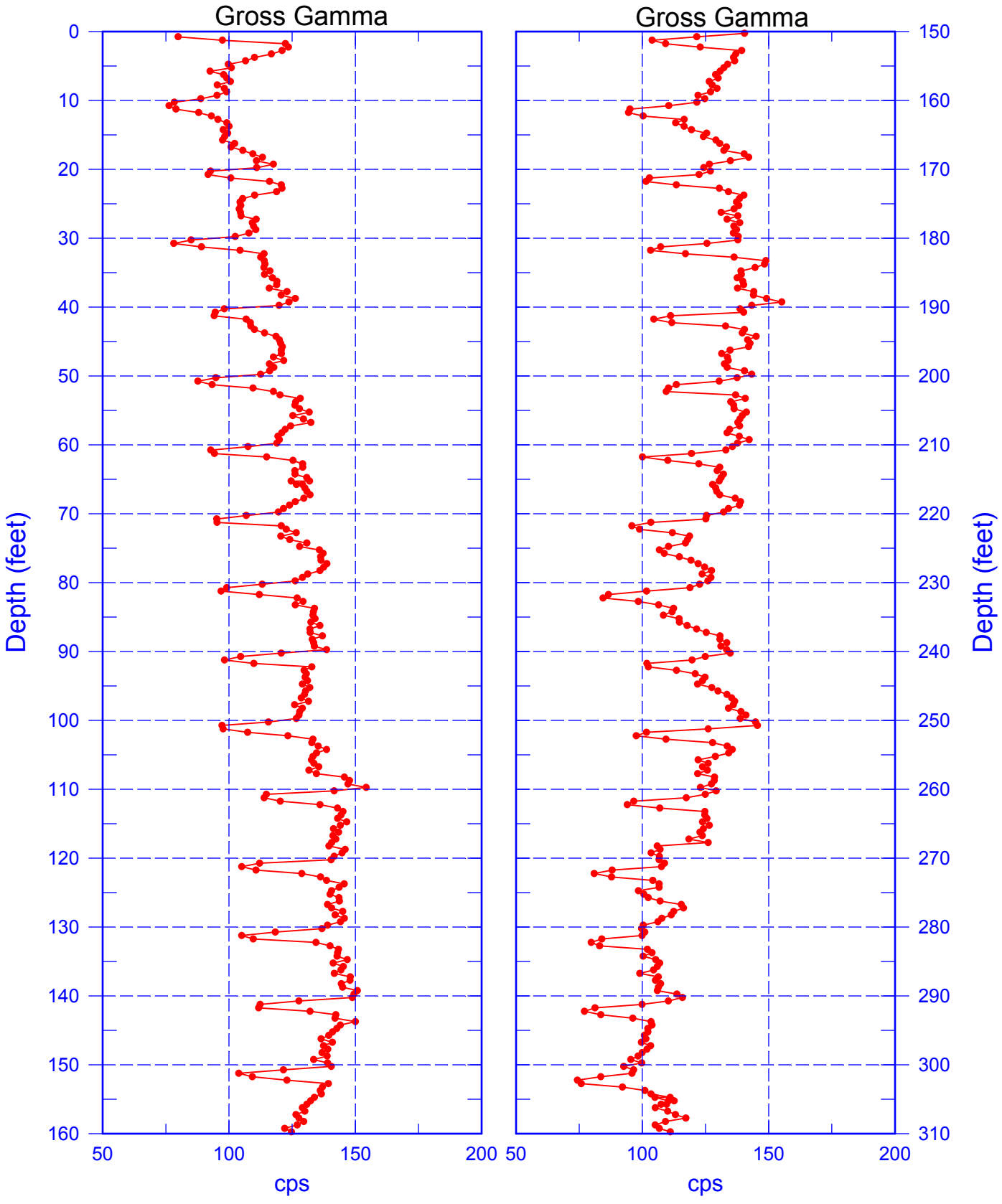

Zero Reference = Ground Surface

Date of Last Logging Run
12/22/2003

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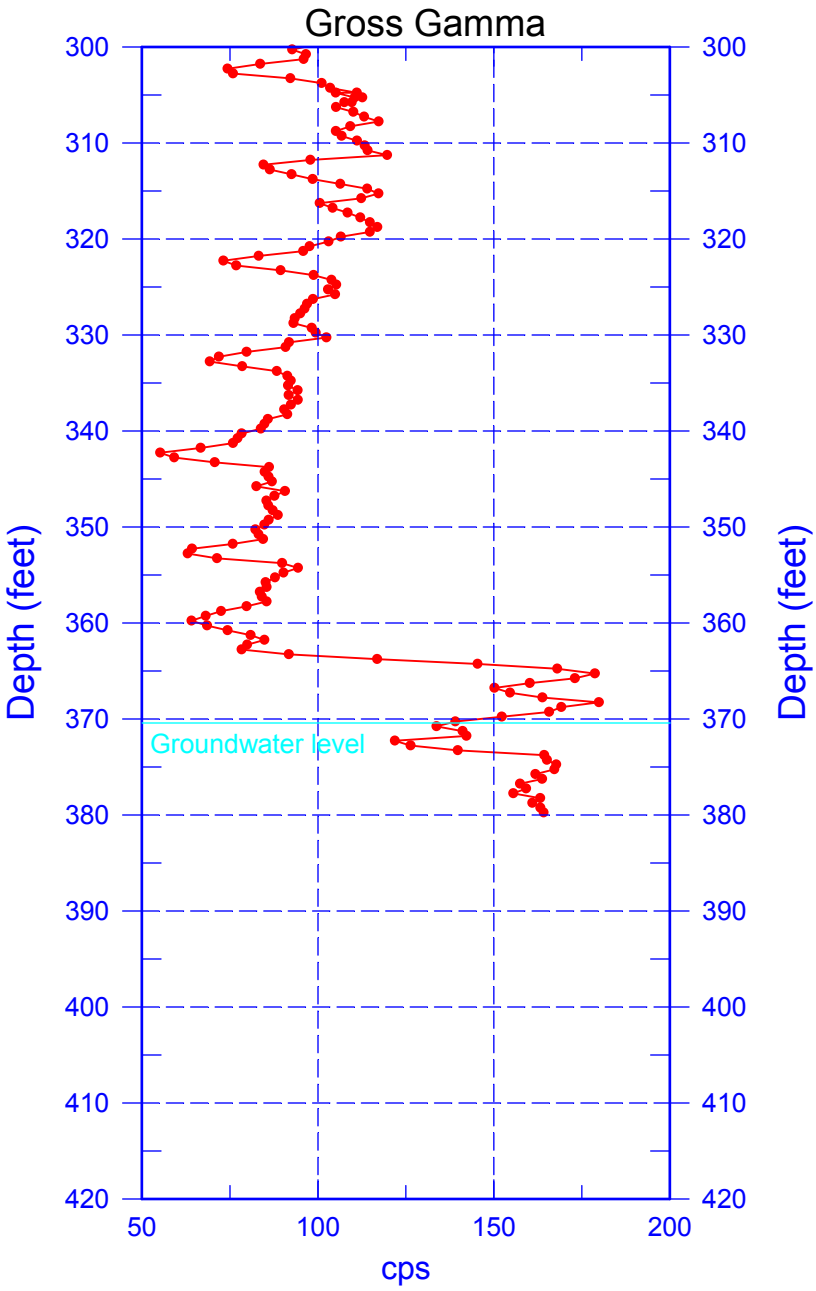

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Repeat of Gross Gamma Log (156.0 to 194.0 ft)